

Directions: You are allowed one 3"X 5" note card and a scientific calculator—no other electronics. Complete all your work on the separate piece of paper provided. You must show all of your work to receive full credit—solutions submitted without showing work (where possible) will receive no partial credit. Please **box** your answers. If I can not find your answer, I can't give you points for it. Write your name at the top of every page of the exam. If you do this, you get a free 2 points. If you finish the test before time is up, please review your work and make sure the work presented is 100% correct.

1. Convert to the desired unit use the following conversion chart:

(a) 24 inches to yards

(b) 16 yards to centimeters

$$1 \text{ in} = 2.54 \text{ cm} = 0.0254 \text{ m}$$

$$1 \text{ ft} = 30.5 \text{ cm} = 0.305 \text{ m}$$

$$36 \text{ in} = 3.0 \text{ ft} = 1.0 \text{ yd}$$

2. Simplify the following expressions. Write your final answers with only positive exponents.

(a) $\frac{\left(\frac{x}{y}\right)^4}{\left(\frac{x^2}{y^3}\right)}$

(b) $\frac{2^{-1}x^2y^{-2}}{x^{-1}y^5} \cdot \frac{4x^4}{y^2}$

(c) $\sqrt{\frac{a^3b^4}{c^6}} \cdot \frac{c^{-2}\sqrt{a}}{b^0}$

3. Correct the following Scientific notation.

(a) $0.0012 \cdot 10^{-3}$

(b) $-654.45 \cdot 10^{-9}$

4. Calculate the following (no credit will be given if your work is not shown)

(a) $8^{2/3}$

(b) $25^{-1/2}$

(c) $\frac{6.28 \cdot 10^{15}}{3.14 \cdot 10^8}$

5. Simplify the following expression using only the definitions of exponents

$$\left(\frac{2a^2b^3}{ab^2}\right)^{-2}$$

6. Transform the function $f(x) = x^2$ into a new function $g(x)$ by: (i). Stretching $f(x)$ by a factor of 2 (ii). Shifting the result horizontally right 3 units (iii). Reflecting across x-axis (iv). Shifting down by 5 units

7. Given the equation $f(x) = -(x + 3)^2 + 2$:

(a) Find the vertex of the equation.

(b) Find the coordinates of the focal point.

(c) Graph the equation and include the axis of symmetry.

8. Given the equation $p(t) = t^2 - 3t + 2$:

(a) Find the vertex of the equation.

(b) Find the y-intercept.

(c) Find the x-intercept(s).